

Claims:

1. A rotary machine comprising a housing and a rotor received therein, characterized in that the inner surface of the housing is shaped by two intersecting cylinder parts having different diameters and parallel axes; the rotor received in the housing is coaxial with the smaller-diameter cylinder and has at least two segmental rotor parts mounting annular rotor covers and at least two pairs of annular elements connected in pairs and adapted to turn relative to the segmental rotor parts; the machine further comprises pivotal elements accommodated between the annular elements of each pair; a driving member, whose axis of rotation is coincident with the axis of the larger-diameter cylinder and which is received in the openings of the pivotal elements for movement therein to bring its working surfaces, during rotation thereof, into contact with the inner working surfaces of the segmental rotor parts, rotor covers, and the inner end-face and cylindrical surfaces of the housing in order to define inner variable-volume working chambers between the segmental rotor parts and the driving member, and outer variable-volume working chambers between the driving member, the inner surfaces of the housing, and the outer surfaces of the rotor.

2. A rotary machine as claimed in claim 1, characterized in that the pairs of annular elements are designed to move over, and engage, inner annular guides of the segmental rotor parts.

3. A rotary machine as claimed in claim 1, characterized in that the pairs of annular elements embrace the segmental rotor parts and are in contact with the inner cylindrical surface of the smaller-diameter housing part for movement in, and engagement with, the annular guides of the segmental rotor parts.

4. A rotary machine as claimed in claim 1, characterized in that the pairs of annular elements embrace the segmental rotor parts and are in contact with the inner cylindrical surface of the smaller-diameter housing part for movement in annular guides of one another and engagement with the segmental rotor parts.

5. A rotary machine as claimed in claim 3 or 4, characterized in that the pairs of annular elements embrace one another on two sides during movement relative to one another.

6. A rotary machine as claimed in any of claims 2, 3 or 4, characterized in that the pairs of annular elements are adapted to move in annular guides of the rotor covers.

7. A rotary machine as claimed in claim 1, characterized in that the annular guides of the segmental rotor parts and rotor covers and the end-face surfaces of the housing are provided with rolling-contact bearings.

8. A rotary machine as claimed in claim 1, characterized in that the inner cylindrical surface of the smaller-diameter housing part is rippled to increase resistance to the flow of escaping gases.

9. A rotary machine as claimed in claim 1, characterized in that the openings of the

pivotal elements have a shape complementary to the shape of the driving member and are adapted to slide therein.

10. A rotary machine as claimed in claim 1, characterized in that the end-face parts of the pivotal elements are provided at connecting points of the annular elements in rolling-contact bearings.

11. A rotary machine as claimed in claim 1, characterized in that the openings of the pivotal elements accommodate rolling-contact bearings for engaging the driving member.

12. A rotary machine as claimed in claim 1, characterized in that the annular elements have reinforcing and cooling plates, and the housing is provided with coolant passages.

13. A rotary machine as claimed in claim 1, characterized in that the driving member comprises a single plate or a plurality of interconnected plates and has a two-, three- or multi-lobed cross-section so that the lobes are received in the pivotal elements, the angles between the lobes are equal, and each segmental rotor part has a flat or two-sided surface, the angle between the lobes being equal to that between the sides to ensure contact between the driving member and the segmental rotor parts during rotation thereof.

14. A rotary machine as claimed in claim 13, characterized in that the driving member has parallel side faces and rounded short sides interacting with the inner cylindrical surface of the larger-diameter housing part.

15. A rotary machine as claimed in claim 14, characterized in that the rounded short sides of the driving member have a radius of curvature larger than the distance from the center of rotation of the rotor to the pivotal elements.

16. A rotary machine comprising a housing and a rotor received therein, characterized in that the inner surface of the housing is shaped by two intersecting cylinder parts of different diameters having parallel axes; the rotor received in the housing is coaxial to the smaller-diameter housing cylinder part and comprises at least two pairs of elements interconnected in pairs and having annular guides; each pair of elements comprises a segmental element and an annular element and is adapted to move in the annular guides of the other pair; the machine comprises pivotal elements interposed between the elements of each pair; a driving member having an axis of rotation coincident with the axis of the larger-diameter housing cylinder part and accommodated in the openings of the pivotal elements for movement therein, and having its working surfaces in contact with the inner working surfaces of the segmental rotor elements and with the inner end faces and the cylindrical surface of the housing to define inner variable-volume working chambers between the inner surfaces of the annular elements and the driving member and outer variable-volume working chambers between the driving member, the outer surfaces of the rotor, and the inner surfaces of the housing.

17. A rotary machine as claimed in claim 16, characterized in that pairs of annular elements are further adapted to move in the annular guides of the rotor covers.

18. A rotary machine as claimed in claim 16, characterized in that the inner cylindrical surface of the smaller-diameter housing cylinder part is rippled to increase resistance to the passage of escaping gases.

19. A rotary machine as claimed in claim 16, characterized in that the annular guides of the annular elements and segmental elements, and the end-face surfaces of the housing have rolling-contact bearings.

20. A rotary machine as claimed in claim 16, characterized in that the openings of the pivotal elements have a shape complementary to that of the driving member for the driving member to slide therein.

21. A rotary machine as claimed in claim 16, characterized in that the end-face parts of the pivotal elements are provided at the connecting points of annular and segmental elements in rolling-contact bearings.

22. A rotary machine as claimed in claim 16, characterized in that the openings of the pivotal elements accommodate rolling-contact bearings for interacting with the driving member.

23. A rotary machine as claimed in any of claims 16 to 22, characterized in that the annular and segmental elements have reinforcing and cooling plates and the housing has coolant passages.

24. A rotary machine as claimed in claim 16, characterized in that the driving member comprises a single plate or a plurality of interconnected plates that have a two-, three- or multi-lobed cross-section so that the lobes are received in the pivotal elements, the angles between the lobes are equal, and each segmental rotor part has a flat or two-sided surface, the angle between the lobes being equal to the angle between the sides to maintain contact between the driving member and the segmental rotor parts during rotation thereof.

25. A rotary machine as claimed in claim 16, characterized in that the driving member has parallel longitudinal sides and rounded short sides interacting with the inner cylindrical surface of the larger-diameter housing part.

26. A rotary machine as claimed in claim 16, characterized in that the rounded parts of the short sides of the driving member have a radius of curvature larger than the distance from the center of rotation of the rotor to the pivotal elements.

27. A driving member of a rotary machine, comprising a casing, wherein each part thereof between the axis of rotation of the rotor and each of the working surfaces designed to be in contact with the inner cylindrical surface of the housing is provided with communicating inner chambers, one of which is a combustion working chamber and the other chamber is designed to be filled with a working fluid for subsequently purging the working chamber so that a fuel mixture can be injected into it and the combustion products are discharged into the main working chamber of the rotary machine.

28. A driving member as claimed in claim 27, characterized in that it has passages and valves provided therein for transferring the working fluid to the working chambers following compression thereof.

29. A driving member as claimed in claim 27, characterized in that it is provided with outlet ports in the shape of nozzles.

30. A driving member as claimed in claim 25, characterized in that each of the

combustion working chambers has double walls.

31. An engine plant comprising at least one first rotary machine constructed as claimed in any of claims 1 to 15 or claims 16 to 26, operating as a pump, and at least another second rotary machine constructed as claimed in any of claims 1 to 15 or claims 16 to 26, operating as an engine, the outlet of each first rotary machine being connected to at least one working chamber of each second rotary machine directly or via a receiver.